Career & Technical Education

Program of Studies

Implementation Manual

Revised
December 2001

Course Models

Kentucky Department of Education
Career & Technical Education

INDUSTRIAL EDUCATION

Course Title	Recommended Grade Level				Recommended Credit
	9	10	11	12	
Air Conditioning Technology		x	x	x	½ -8
Automotive Technology		x	x	x	½ -8
Aviation Technology		x	x	x	½ -8
Collision Repair and Refinish Technology		x	x	x	½ -8
Commercial and Recreational Small Engine Technology		x	x	x	½ -8
Electronics Technology		x	x	x	½ -8
Computer Aided Drafting		x	x	x	½ -8
Computer Systems Technology	x	x	x	x	½ -8
Desktop Publishing		x	x	x	½ -8
Diesel Technology		x	x	x	½ -8
Industrial Automation Technology		x	x	x	½ -8
Industrial Chemical Technology		x	x	x	½ -8
Industrial Electronics Technology		x	x	x	½ -8
Industrial Maintenance Technology		x	x	x	½ -8
Machine Tool Technology		x	x	x	½ -8
Major Appliance Technology		x	x	x	½ -8
Masonry		x	x	x	½ -8
Metal Fabrication		x	x	x	½ -8
Multimedia Technology		x	x	x	½ -8
Plastics Technology		x	x	x	½ -8
Plumbing Technology		x	x	x	½ -8
Printing Technology		x	x	x	½ -8
Residential/Commercial Carpentry		x	x	x	½ -8
Residential/Commercial Electricity		x	x	x	½ -8
Telemedia Technology		x	x	x	½ -8
Visual Communication Art Technology		x	x	x	½ -8
Welding		x	x	x	½ -8
Wood Products Manufacturing		x	x	x	½ -8

Overview of Industrial Technology Education

Industrial Education programs are designed to provide specialized skills related to a variety of occupations. Emphasis is placed upon employability skills, state and national skill standards and student transition to postsecondary education or the work place. The content of Industrial Education is organized around four distinct program organizers: **Communication**, **Construction**, **Manufacturing** and **Transportation**. The programs are intended to be relevant to the modern workplace as related to technology, academics, skill standards and technical skills.

Students exiting secondary industrial education programs should be prepared to enter the

workforce at an entry level with marketable job skills. However, it must be realized that additional education beyond high school is necessary in order to obtain and maintain higher level skills required by employers. Educators must be made aware that the academic demands of the workplace are higher than ever. The utilization of high technology in all career fields has continued and will continue to raise the academic skills required in addition too new and more advanced technical skill requirements.

Students are encouraged to participate in cooperative education and other work-based learning experiences. Cooperative Education consists of in-school instruction combined with on-the-job work experience. Specific guidelines are outlined in 705 KAR 4:041. Information on other types of work-based learning are described in detail in the document Work-Based Learning Guide 2000, which is available on the KDE web page at: www.kde.state.ky.us/careerandtechnicaleducation/resourcesandpublications.

The Industrial Education Facility must reflect the related industry in as much as possible, in order to provide students with real work related experiences. Facilities should be highly organized, clean, properly lighted, and properly equipped to the maximum of budget allowances. Provisions for access to equipment that is not financially feasible should be sought out through articulation agreements with post secondary institutions or through industry contacts who may loan or provide access.

Industrial Education programs should organize and conduct regular meetings with a local advisory council, which is made up of business and industry members, in the area of each program. In addition, Industrial Education programs should actively develop articulation agreements with post secondary institutions for transfer of credit. This program should also use the state adopted articulation agreement in the area of electronics.

Curriculum Delivery

There are a variety of methods available that teachers may use to teach industrial education programs. Teachers may follow and use the Kentucky Tech Curriculum or the new KCTCS post secondary curriculum. These curriculums emphasize the use of O*Net Certificates. Another integral part of the curriculum delivery systems must be the inclusion of state and national skill standards that are related to each program area. This will provide greater relevancy and accountability for students and programs. Instruction must also include integration of appropriate student organization activities such as the SkillsUSA-VICA Professional Development Program, Skills USA Competition and other organization activities. In addition, integration projects with other academic and Career and Technical teachers is highly recommended and should be implemented whenever possible. Integrated instruction provides relevancy of academic content to real world applications within the context of any given career field.

Programs must address the employability skills that all students need, as future employees. These skill will be needed to be successful in future experiences. Included in the program should be the expectations and standards of performance for student behavior and accountability.

Communications Career Cluster

Career Majors				
Desktop Publishing Technology	**Printing Technology**	**Visual Communication Art**	**Communications Electronics**	**Computer Aided Drafting**
Technology Education (Middle School) - (for career awareness - no credit toward career major)				
Recommended Courses	**Recommended Courses**	**Recommended Courses**	**Recommended Courses**	**Recommended Courses**
Touch Keyboarding Computer Fundamentals Intro. to Graphic Com. Design Layout & Paste Up/Lab Typography and Typesetting/Lab Desktop Pub.for Graphics/Lab Desktop Publishing Special Applications	Intro. To Graphic Communications. Lithographic Camera and Darkroom Lithographic Film Assembly and Platemaking Press I & II/ Lab Technical Communications	Keyboarding Computer Fundamentals Fundamentals of Drawing I & II Color Theory Applications Trad. Layout and Graphic Design Trad. Illustration Screen Printing Computer Graphic Design /Lab Computer Illustration I / Lab	Electrical/Electronic Safety Direct Current Circuits/Lab Alternating Current Circuits / Lab Electrical Circuit Analysis Electrical Principles Devices and Circuits I & II / Lab Electronic Devices and Circuits Electronic Drafting Microcomputer Operating Systems	Basic Drafting I & II CAD I Basic Blueprint Reading Pictorial Drawing Basic Refrigeration Duct Design Illustration Techniques and Working Drawings Basic Welding and Industrial Drafting Processes Threads and Fasteners Gears and Cams Pipe Drafting
Elective Courses	**Elective Courses**	**Elective Courses**	**Elective Courses**	**Elective Courses**
⇒Technology Education *Typography and Typesetting *Other career related courses	⇒Technology Education *Special Applications *Other career related courses	⇒Technology Education *Production Art *Trad. Layout and Graphic Design *Other career related courses	⇒Technology Education *Applied Math *Technical Math I & II *Industrial Safety *Other career related courses	⇒Technology Education *CAD II & III *Computer Fundamentals *Applied Math *Other career related courses
⇒ See the Technology Education - A Curriculum Framework for specific course titles *Other Career and Technical Education courses directly related to a career major/O*net Certificates.				
NOTE: Three credits must come from recommended courses. To complete a career major, students must earn four career-related credits within the major and 3 math, 2 science, 4 English, and 2 social studies credits.				

Special Note: The courses identified are specific content courses contained within the Kentucky Tech Curriculum. These sub-courses are used to deliver the specific technical content of each major and courses specified in this implementation manual.

Communications Career Cluster

Career Majors				
Computer Systems Technology	**Multimedia Technology**	**Telemedia Technology**		
Technology Education (Middle School) - (for career awareness - no credit toward career major)				
Recommended Courses	**Recommended Courses**	**Recommended Courses**	**Recommended Courses**	**Recommended Courses**
Electrical/Electronic Safety Direct Current Circuits/Lab Microprocessor and Interfacing Computer Repair and Servicing Technology I & II Networking Content	Keyboarding Computer Fundamentals Introduction to Multimedia Introduction to Audio and Video Multimedia Audio and Video/Lab Desktop Publishing Computer Illustration I Basic Telecommunications and Imaging Editing	Keyboarding Computer Fundamentals Audio/Video Control Room Equipment Electronic Field Production Equipment Broadcast Transmission Systems Editing Equipment		
Elective Courses	**Elective Courses**	**Elective Courses**	**Elective Courses**	**Elective Courses**
⇒Technology Education *Other career related courses	⇒Technology Education *Special Applications *Other career related courses	⇒Technology Education *Production Art *Other career related courses *		
⇒ See the Technology Education - A Curriculum Framework for specific course titles *Other Career and Technical Education courses directly related to a career major/O*net Certificates.				
NOTE: Three credits must come from recommended courses. To complete a career major, students must earn four career-related credits within the major and 3 math, 2 science, 4 English, and 2 social studies credits.				

Special Note: The courses identified are specific content courses contained within the Kentucky Tech Curriculum. These sub-courses are used to deliver the specific technical content of each major and courses specified in this implementation manual.

Construction Career Cluster

Career Majors				
Masonry	**Residential - Commercial Carpentry**	**Residential-Commercial Electricity**	**Plumbing Technology**	**Metal Fabrication**
Technology Education (Middle School) - (for career awareness - no credit toward career major)				
Recommended Courses	**Recommended Courses**	**Recommended Courses**	**Recommended Courses**	**Recommended Courses**
Introductory Masonry Advanced Masonry Masonry Lab Brick Construction Special Techniques in Brick Construction Blueprint Reading for Construction Anchors and Reinforcement	Blueprint Reading for Construction Power Tools and Maintenance Shop Power Tools and Maintenance Lab Site Layout and Foundations Floor and Wall Framing / Lab	Direct Current Circuits / Lab Alternating Current Circuits / Lab Transformers / Lab Devices and Circuits I & II / Lab Electrical Drafting National Electric Code Electrical Construction I & II / Lab	Plumbing Fundamentals / Lab Blueprint Reading for Construction Service and Repair Fixtures and Appliances	Heat Load Calculations Duct Design Basic Welding Blueprint Reading Maintaining Industrial Equipment Parallel Line Layout Triangulation Sheet Metal I & II Radial Line Development Computer Fundamentals
Elective Courses	**Elective Courses**	**Elective Courses**	**Elective Courses**	**Elective Courses**
⇒Technology Education *Industrial Safety *Economics and Financial Management *Other career related courses	⇒Technology Education *Introduction to Drywall *Exterior and Interior Finish *Other career related courses	⇒Technology Education *Electrical Motor Controls *Programmable Controllers *Other career related courses *	⇒Technology Education *Applied Math *Technical Math I & II *Industrial Safety *Other career related courses	⇒Technology Education *Industrial Safety *Other career related courses
⇒ See the Technology Education - A Curriculum Framework for specific course titles *Other Career and Technical Education courses directly related to a career major/O*net Certificates.				
NOTE: Three credits must come from recommended courses. To complete a career major, students must earn four career-related credits within the major and 3 math, 2 science, 4 English, and 2 social studies credits.				

Special Note: The courses identified are specific content courses contained within the Kentucky Tech Curriculum. These sub-courses are used to deliver the specific technical content of each major and courses specified in this implementation manual.

Construction Career Cluster

Career Majors				
Welding	**Wood Products Manufacturing**			
Technology Education (Middle School) - (for career awareness - no credit toward career major)				
Blueprint Reading for Construction SMAW Plate Lab I & II/Lab Gas Tungsten Arc Welding/Lab Certification Welding/Lab Oxy-Fuel Systems Oxy-fuel Cutting Lab	Wood Product Manufacturing Cabinet Making Technology Wood Finishing Technical Drawing and Blueprint Reading Furniture Technology Millwork Technology			
Elective Courses	**Elective Courses**			
⇒Technology Education *Industrial Safety *Other career related courses	⇒Technology Education *Industrial Safety *Cooperative Education *Other career related courses *			
⇒ See the Technology Education - A Curriculum Framework for specific course titles *Other Career and Technical Education courses directly related to a career major/O*net Certificates.				
NOTE: Three credits must come from recommended courses. To complete a career major, students must earn four career-related credits within the major and 3 math, 2 science, 4 English, and 2 social studies credits.				

Special Note: The courses identified are specific content courses contained within the Kentucky Tech Curriculum. These sub-courses are used to deliver the specific technical content of each major and courses specified in this implementation manual.

Transportation Career Cluster

Career Majors				
Automotive Technology	**Collision Repair and Refinish Technology**	**Diesel Technology**	**Com./Rec. Small Engine Technology**	**Aviation Technology**
Technology Education (Middle School) - (for career awareness - no credit toward career major)				
Recommended Courses	**Recommended Courses**	**Recommended Courses**	**Recommended Courses**	**Recommended Courses**
Brake Systems / Lab Automatic Transmission / Transaxles /Lab Manual Transmissions/Lab Engine Repair /Lab Computer Systems & Diagnosis /Lab Basic Automotive Electronics/Lab Electrical Systems/ Lab	Intro. to Auto Body Industrial Safety Painting and Refinishing / Lab Non-Structural Analysis and Damage Repair/Lab Non-Structural Analysis and Damage Repair / Lab II Structural Analysis and Damage Repair / Lab I & II	Mechanical Concepts Fluid Power & Lab Fuel Injection I/Lab Electrical Systems/Lab Basic Electricity/Lab Brakes I / Lab Power Trains I & Lab	Introduction to Small Engine Repair Basic Small Engine Theory/Lab Ignition/Charging Systems Fuel Systems /Lab Four Stroke Cycle Engine/Lab Two Stroke Cycle Engine/Lab	Blueprint Reading and Drawing Aircraft Weight and Balance / Lab Aircraft Cleaning and Corrosion Control / Lab
Elective Courses	**Elective Courses**	**Elective Courses**	**Elective Courses**	**Elective Courses**
⇒Technology Education *Suspension and Steering /Lab *Basic Fuel & Ignition Systems / Lab *Fuel Injection & Emission Systems / Lab *Other career related courses	⇒Technology Education *Fundamentals of Electricity *Consumer Economics *Other career related courses	⇒Technology Education *Consumer Economics *Steering and Suspension *Other career related courses *	⇒Technology Education *Electrical Systems *Introduction to Motorcycle Technology *Other career related courses	⇒Technology Education *Physics *Computer Fundamentals *Applied Math *Other career related courses
⇒ See the Technology Education - A Curriculum Framework for specific course titles *Other Career and Technical Education courses directly related to a career major/O*net Certificates.				
NOTE: Three credits must come from recommended courses. To complete a career major, students must earn four career-related credits within the major and 3 math, 2 science, 4 English, and 2 social studies credits.				

Special Note: The courses identified are specific content courses contained within the Kentucky Tech Curriculum. These sub-courses are used to deliver the specific technical content of each major and courses specified in this implementation manual.

Manufacturing Career Cluster

Career Majors				
Industrial Electronics Technology	**Machine Tool Technology**	**Air Conditioning Technology**	**Industrial Maintenance Technology**	**Industrial Automation Technology**
Technology Education (Middle School) - (for career awareness - no credit toward career major)				
Recommended Courses	**Recommended Courses**	**Recommended Courses**	**Recommended Courses**	**Recommended Courses**
Electrical/Electronic Safety Direct Current Circuits/Lab Alternating Current Circuits / Lab Electrical Circuit Analysis Electrical Principles Devices and Circuits I & II / Lab Electronic Devices and Circuits Electronic Drafting Microcomputer Operating Systems	3- D Industrial Programming / Lab Fundamentals of Machine Tools Manual Programming CAD/CAM/CNC Blueprint Reading Computer Fundamentals	Basic Refrigeration Refrigeration Applications I / Lab Electrical Components / Lab Duct Design Heat Load Calculations Cooling and Dehumidification / Lab Heating and Humidification / Lab Heat Pump Application/ Lab Blueprint Reading for Construction	Basic Electricity / Lab Basic Blueprint Reading Fluid Power / Lab Industrial Maintenance Rotating Machinery / Lab Maintaining Industrial Equipment Industrial Maintenance Electrical Motor Controls I / Lab Industrial Safety Electrical Motor Controls II / Lab	Basic Electricity / Lab Basic Troubleshooting Computer Fundamentals Digital Systems and Microprocessors Electronic Drafting Fluid Power / Lab Industrial Safety Advanced Hydraulic Systems / Lab Advanced Pneumatic Systems and Lab Technical Communications Technical Mathematics
Elective Courses	**Elective Courses**	**Elective Courses**	**Elective Courses**	**Elective Courses**
⇒Technology Education *Typography and Typesetting *Other career related courses	⇒Technology Education *Applied Machining *Hazardous Materials Handling and Storage *Other career related courses	⇒Technology Education *Sheet Metal Fabrication *Ice Machines *Other career related courses	⇒Technology Education *Applied Math *Fundamentals of Machine Tools *Oxy-Fuel Systems *Other career related courses	⇒Technology Education *CAD I *Robotics *Applied Math *Other career related courses
⇒ See the Technology Education - A Curriculum Framework for specific course titles *Other Career and Technical Education courses directly related to a career major/O*net Certificates.				
NOTE: Three credits must come from recommended courses. To complete a career major, students must earn four career-related credits within the major and 3 math, 2 science, 4 English, and 2 social studies credits.				

Special Note: The courses identified are specific content courses contained within the Kentucky Tech Curriculum. These sub-courses are used to deliver the specific technical content of each major and courses specified in this implementation manual.

Manufacturing Career Cluster

Career Majors				
Welding	**Wood Products Manufacturing**	**Major Appliance Technology**	**Industrial Chemical Technology**	**Plastics Technology**
Technology Education (Middle School) - (for career awareness - no credit toward career major)				
Recommended Courses	**Recommended Courses**	**Recommended Courses**	**Recommended Courses**	**Recommended Courses**
Blueprint Reading for Construction SMAW Plate Lab I & II/Lab Gas Tungsten Arc Welding/Lab Certification Welding/Lab Oxy-Fuel Systems Oxy-fuel Cutting Lab	Wood Product Manufacturing Cabinet Making Technology Wood Finishing Technical Drawing and Blueprint Reading Furniture Technology Millwork Technology	Basic Refrigeration and Air Conditioning Electrical Components and Test Equipment Gas/Electric Appliance Applications Blueprint Reading	Basic Electricity Blueprint Reading Maintenance of Industrial Equipment Fluid Power Systems	Computer Fundamentals Fluid and Mechanical Power Systems Basic Electronics Motors and Motor Control Polymer Science and Testing
Elective Courses	**Elective Courses**			
⇒Technology Education *Industrial Safety *Other career related courses	⇒Technology Education *Industrial Safety *Other career related courses *	⇒Technology Education *Industrial Safety *Other career related courses *	⇒Technology Education *Industrial Safety *Other career related courses *	⇒Technology Education *Industrial Safety *Other career related courses *
⇒ See the Technology Education - A Curriculum Framework for specific course titles *Other Career and Technical Education courses directly related to a career major/O*net Certificates.				
NOTE: Three credits must come from recommended courses. To complete a career major, students must earn four career-related credits within the major and 3 math, 2 science, 4 English, and 2 social studies credits.				

Special Note: The courses identified are specific content courses contained within the Kentucky Tech Curriculum. These sub-courses are used to deliver the specific technical content of each major and courses specified in this implementation manual

.

MODEL COURSE SEQUENCE

COMMUNICATIONS CAREER CLUSTER			
ACADEMIC CORE			
9TH	**10TH**	**11TH**	**12TH**
English	English II	English III	English IV
Algebra I	Geometry	Math Elective ←→	Elective
Science	Science	Health & PE	Science
Social Studies	History & Appreciation of Visual and Performing Arts	Social Studies	Social Studies
TECHNICAL CORE			
Communication Systems	Drafting/Computer Aided Design Tech	Electricity/ Electronics Tech	*Direct Current Circuits
Computer Applications			*Computer Systems Course
MANUFACTURING CAREER CLUSTER			
ACADEMIC CORE			
9TH	**10TH**	**11TH**	**12TH**
English	English II	English III	English IV
Algebra I	Geometry	Math Elective ←→	Elective
Science	Science	Health & PE	Science
Social Studies	History & Appreciation of Visual and Performing Arts	Social Studies	Social Studies
TECHNICAL CORE			
Overview of Tech-nological Systems	Drafting Computer Assisted Design Tech	*Computer Systems Course	*Basic Electricity

***SPECIAL NOTE:** The courses identified are specific content courses contained within the Kentucky TECH curriculum. These sub-courses are used to deliver the specific technical content of each major and courses specified in the Implementation Manual.

MODEL COURSE SEQUENCE

PRINTING TECHNOLOGY CAREER MAJOR			
ACADEMIC CORE			
9TH	**10TH**	**11TH**	**12TH**
English	English II	English III	English IV
Algebra I	Geometry	Math Elective ←→	Elective
Science	Science	Health & PE	Science
Social Studies	History & Appreciation of Visual and Performing Arts	Social Studies	Social Studies
TECHNICAL CORE			
Communication Systems	*Intro to Graphic Communication	*Lithographic Camera & Dark Room Lab	*Press I
*Computer Fundamentals	*Finishing & Binding Operations	*Lithographic Film Assembly and Plate Making Lab	*Press I Lab
			*Design Layout & Paste-Up

PLASTICS TECHNOLOGY CAREER MAJOR			
ACADEMIC CORE			
9TH	**10TH**	**11TH**	**12TH**
English	English II	English III	English IV
Algebra I	Geometry	Math Elective ←→	Elective
Science	Science	Health & PE	Science
Social Studies	History & Appreciation of Visual and Performing Arts	Social Studies	Social Studies
TECHNICAL CORE			
Overview of Technological Systems	*Intro to Automation	*Basic Electronics	*Plastic Processes Materials
*CAD	*Blueprint Reading & Geometric Tolerance	*Motors & Motor Control	*Polymer Science & Testing
	*Auto CAD I	*Fluid & Mech Power Systems	*Injection Molding

Air Conditioning Technology

Course Description: This course includes installing, servicing and repairing heating, air-conditioning and refrigeration equipment. Academic courses include theory and laboratory experiences in the following areas: electricity, electrical components, blueprint reading, heat load calculation, industrial safety, refrigeration, air conditioning, humidification and dehumidification, heat pumps, ice machines, mathematics, science and communications. Leadership and professionalism will also be an integral part of this course provided through participation in SkillsUSA-VICA and the Professional Development Program. These courses are designed to promote success for students entering the air conditioning profession.

Academic Expectations	Content/Process
2.3, 5.1 2.1 , 1.1 2.7, 2.13 2.31 2.2 6.1 1.13, 1.10 2.3 2.1, 6.1 2.10 2.3, 6.3 5.2, 2.10 2.36, 2.38 2.17, 5.4 6.2, 6.3 5.4 1.1	**Students will** • understand and apply basic refrigeration concepts and knowledge as related to air conditioning technology. • demonstrate skill and knowledge with refrigeration applications and electrical components. • demonstrate skill and knowledge of heat load calculations. • develop competencies in the safe and efficient use of the tools, machines, materials and processes of air conditioning technology. • understand and demonstrate skill with concepts of cooling and dehumidification principles. • develop skill and knowledge of heat pump applications. • demonstrate skill and understanding of blueprint reading as related to the construction trades. • develop skill and knowledge with electrical principles and industrial safety. • engage in meaningful, hands-on, minds-on, and conceptual based activities related to air conditioning technology. • demonstrate knowledge of ice machines. • develop skills and competencies in the fabrication of sheet metal and the design of duct work. • develop personal and professional skills through involvement with the SkillsUSA-VICA student organization activities. • demonstrate skills necessary to work with others to solve problems. • apply concepts from mathematics, science, and communications in the context of air conditioning technology. • demonstrate employability and social skills relative to careers. • develop an understanding EPA (Environmental Protection Agency) laws and regulations related to air conditioning technology.

Connections

- Kentucky Occupational Skill Standards
- Kentucky Tech Curriculum
- Heating, Air-Conditioning, and Refrigeration Technician Skill Standards Certification
- Professional Development Program
- Secretary's Commission on Achieving Necessary Skills (SCANS Skills)

Automotive Technology

Course Description: This program includes basic automotive electricity, engine repair, climate control, brake systems, and manual transmissions. Also included are basic fuel and ignition systems, suspension and steering, automatic transmission/transaxles, emission systems, computer control systems and diagnosis, and precision measurement. Leadership and professionalism will be provided through SkillsUSA-VICA and the Professional Development Program.

Academic Expectations	Content/Process
	Students will
2.3	• understand and apply basic and advanced electrical concepts and principles related to automotive technology.
5.5	• understand and apply concepts of engine repair.
5.1	• understand apply concepts of climate control systems.
2.5	• demonstrate knowledge and understanding of automotive brake systems.
6.3	• engage in meaningful, hands-on, minds-on, and conceptual based automotive based activities.
2.34	• develop competencies in the safe and efficient use of the tools, machines, materials, and basic of automotive fundamentals.
2.2	• demonstrate and develop competencies with manual transmissions.
6.2	• apply concepts from mathematics, science, and communications in the context of automotive technology.
2.3, 5.1	• demonstrate and develop competencies with automotive suspension and steering systems.
2.3	• demonstrate knowledge and understanding of fuel and ignition systems.
2.6	• demonstrate knowledge and understanding of automotive emission systems.
1.1	• develop competencies and understanding of automatic transmission and transaxles.
1.16	• use computer based technologies to process information and manipulate computer control systems and diagnostic capabilities.
2.38	• develop workplace readiness and employability skills necessary to work with others, and reach an employable exit point.
2.36, 2.37	• develop personal and professional skills through involvement with the SkillsUSA-VICA student organization activities.
2.37	• demonstrate employability and social skills relative to careers

Connections

- Kentucky Occupational Skill Standards
- Kentucky Tech Curriculum
- NATEF (National Automotive Technicians Education Foundation, Inc.) ASE (Automotive Service Excellence) Certification in Automotive Technology
- Professional Development Program
- Secretary's Commission on Achieving Necessary Skills (SCANS Skills)

Aviation Technology

Course Description: Instruction in aviation careers, aviation history, air traffic control, aircraft maintenance, aerodynamics and flight is the basis for this program. Knowledge of various aircraft systems, maintenance practices, and flight principles are used to develop skills in troubleshooting, and problem solving. Leadership and professionalism will be provided through SkillsUSA-VICA and the Professional Development Program.

Academic Expectations	Content/Process
1.10,1.13 2.3, 6.1 2.20 2.37, 2.38 2.3, 2.10 2.36 2.17, 5.5 5.1, 2.10, 6.3 1.1, 1.16 2.36, 2.37 2.36	**Students will** • understand, apply, and demonstrate aircraft maintenance concepts, principles, and techniques used in the aviation industry. • understand, apply, and demonstrate aircraft flight concepts, principles, and techniques used in the aviation industry. • exhibit knowledge and understanding of aviation history. • demonstrate knowledge and understanding of work ethics and expectations desired for the aviation industry. • engage in meaningful, hands-on, minds-on, and conceptual based aviation related activities. • demonstrate knowledge and understanding of aviation careers, employment outlook, and post-secondary education opportunities. • develop and demonstrate skills necessary to work independently, and with others to solve problems. • develop competencies in the safe and efficient use of the tools, machines, materials, and processes of aviation technology. • apply concepts from mathematics, science, communications and computer skills in the context of aviation technology. • use computer based technologies to process information and manipulate computer control systems. • develop personal and professional skills through involvement with the SkillsUSA-VICA student organization activities. • demonstrate employability and social skills relative to careers.

Connections

- Kentucky Occupational Skill Standards
- Kentucky Tech Curriculum
- Professional Development Program
- FAA Ground School Certification
- Secretary's Commission on Achieving Necessary Skills (SCANS Skills)

Collision Repair and Refinish Technology

Course Description: This program includes introduction to auto body repair, non-structural analysis and damage repair, structural analysis and damage repair, and painting and refinishing. Leadership and professionalism will be provided through SkillsUSA-VICA and the Professional Development Program.

Academic Expectations	Content/Process
	Students will
1.1, 6.2	• integrate and apply core knowledge in the context of collision repair.
2.1, 6.1	• engage in meaningful, hands-on, minds-on, and conceptual based collision repair activities.
2.10	• understand and apply basic concepts of non-structural analysis and damage repair.
5.5,1.1	• demonstrate and apply knowledge in structural analysis and damage repair.
6.2,6.3	• apply concepts from mathematics, science, and communications in the context of collision repair.
1.1	• understand and apply knowledge that is relevant to mechanical and electrical components used in automotive applications.
2.31	• develop and demonstrate competencies with automotive painting and refinishing technologies.
2.2	• develop and demonstrate competencies with automotive plastic and adhesive applications and technologies.
6.2	• develop and demonstrate basic competencies in welding techniques.
1.16	• use computer based technologies to process information related to collision repair.
2.17, 5.4	• demonstrate employability and social skills relative to careers.
5.1, 2.31	• develop competencies in the safe and efficient use of the tools, machines, materials, and processes of automotive technology.
2.36, 2.37	• develop personal and professional skills through involvement with the SkillsUSA-VICA student organization activities.

Connections

- Kentucky Occupational Skill Standards
- Kentucky Tech Curriculum
- NATEF (National Automotive Technicians Education Foundation, Inc.) ASE (Automotive Service Excellence) Certification in Collision Repair and Refinish.
- I-CAR (Inter-industry Conference on Auto Collision Repair) Curriculum
- Professional Development Program
- Secretary's Commission on Achieving Necessary Skills (SCANS Skills)

Communications Electronics

Course Description: This program includes basic AC & DC circuits, electronic devices & circuits, schematic literacy, digital electronics, microprocessors, fiber optics, analog and digital communications systems and microwave technology. A solid base of communications and information management, technical mathematics and algebra, as well industrial safety and tool systems will be developed through direct application. Leadership and professionalism will be developed through SkillsUSA-VICA and the Professional Development Program.

Academic Expectations	Content/Process
1.1, 1.10 1.5 - 1.9 2.1, 2.10 2.3, 5.3 5.5 5.1 6.3 5.5 6.1 2.17 5.5 2.5 2.38 2.36 6.2, 6.3	**Students will** • develop competencies and skills in the area of electronic drafting/and the use of schematics. • develop competencies and skills with digital techniques. • engage in meaningful, hands-on, minds-on and conceptual based activities in the area of electronic technology. • develop skills and competencies with electrical/electronics math/algebra. • demonstrate knowledge and understanding of service equipment and digital techniques. • develop competencies in the safe and efficient use of the tools, machines, materials, and processes of communication electronic technology. • develop knowledge and skills with the applications of microprocessors and fiber optics. • develop skills necessary to work with others and solve problems. • understand and apply knowledge of direct current circuits and alternating current circuits as related to communication electronic technology. • understand and apply knowledge of electronic devices and components in the context of communication electronics. • understand and apply knowledge of RF energy including ionospheric propagation and microwave systems. • develop and demonstrate knowledge of personal electromagnetic field safety through shielding and good engineering. • develop personal and professional leadership skill through participation in the SkillsUSA-VICA student organization activities. • demonstrate employability and personal management skills relative to careers through the Professional Development Program. • apply concepts from mathematics, science, and communications in the context of collision repair.

Connections

- Kentucky Occupational Skill Standards
- Kentucky Tech Curriculum
- Skill Standards such as EAI (Electronics Industries Association).
- FCC rules and regulations.
- Professional Development Program
- Secretary's Commission on Achieving Necessary Skills (SCANS Skills)

Computer Aided Drafting

Course Description: This program includes applied mathematics, computer fundamentals, basic drafting, computer aided drafting and advanced dimensioning. Leadership and professionalism will be provided through SkillsUSA-VICA and the Professional Development Program.

Academic Expectations	Content/Process
	Students will
6.3, 2.3	• apply knowledge and understanding of basic computer aided drafting.
2.2, 5.5	• develop knowledge and understanding of concepts of CAD architecture, construction techniques, structural systems and design and planning.
1.1, 5.5	• engage in hands-on, minds-on, and conceptual based computer aided drafting activities.
2.1, 6.1	• demonstrate knowledge and skill with illustration techniques and working drawings.
1.12	• develop skill and knowledge of surveying and working drawings.
1.16	• demonstrate skills and abilities with keyboarding, electronic and electrical drafting.
6.3	• apply concepts from mathematics, science, and communications in the context of computer aided drafting.
6.2	• develop knowledge and understanding of basic welding and industrial drafting processes.
5.3	• develop and demonstrate competencies with pictorial drawings, threads and fasteners, gears and cams, and pipe drafting.
2.36, 2.38	• develop personal and professional leadership skills through involvement with the SkillsUSA-VICA student organization activities.
2.17, 5.4	• demonstrate employability and social skills relative to careers.

Connections

- Kentucky Occupational Skill Standards
- Kentucky Tech Curriculum
- CADD Skill Standards or related standards
- Professional Development Program
- Secretary's Commission on Achieving Necessary Skills (SCANS Skills)

Computer Systems Technology

Course Description: This program will provide skill development and instruction related to PC repair, software applications, hardware, networking systems, computer maintenance, system diagnostics, networks data communications, and other networking related content. Participation in the SkillsUSA-VICA student organization and STLP will also be an integral part of this course.

Academic Expectations	Content/Process
1.16, 1.1 1.10 5.1 2.13 6.3 2.1, 2.7, 1.1 2.12 1.2 2.36 2.37, 2.38 6.1, 6.2 2.36 6.1, 5.5	**Students will** • demonstrate knowledge and skill with computer fundamentals such as system components, memory, connections, PC assembly/disassembly and maintenance procedures. • demonstrate knowledge and skill with software applications related to operating systems, diagnostic software and platforms. • develop skills, knowledge and understanding of local area networks in topics such as topologies, network design, software, protocols and OSI layers. • develop skills knowledge and understanding of dial up communications concepts such as phone lines, communication software, file transfer and troubleshooting. • develop knowledge and understanding of peer-to-peer network concepts. • apply concepts from mathematics, science, communications and computer skills in the context of computer systems technology. • demonstrate knowledge and understanding of basic I/O such as keyboards, video, monitors, troubleshooting and other I/O components. • develop knowledge and skills related to drive components and related problems and applications. • demonstrate employability and social skills relative to careers. • develop personal and professional development skills through involvement in SkillsUSA-VICA student organization activities and STLP (Student Technology Leadership Program. • demonstrate and develop skills with wide area networks including e-mail, Internet, network topologies, components, routers, WAN services and other related content. • demonstrate knowledge and understanding of computer systems careers, employment outlook and post-secondary education opportunities. • engage in meaningful, hands-on, minds-on and conceptual based computer systems related concepts.

Connections

- Kentucky Occupational Skill Standards
- A+ Certification
- CNA (Certified Novell Administrator) or MSCE (Microsoft Certified Engineer) Certification
- Professional Development Program
- Secretary's Commission on Achieving Necessary Skills (SCANS Skills)
- Student Technology Leadership Program (STLP)

Commercial and Recreational Small Engine Technology

Course Description: This course will instruct students in practical information about lawn equipment, light commercial, marine and/or motorcycle engine construction, operation, lubrication, maintenance, troubleshooting, service, rebuilding, and repair. Continuing students will develop skills in maintaining full chassis and power transfer systems in lawn, light commercial, marine and/or motorcycle equipment. Students will demonstrate the safe and proper use of hand, measuring and power tools in a live work type environment Leadership and professionalism will be developed through SkillsUSA-VICA and the Professional Development Program.

Academic Expectations	Content/Process
1.1, 6.1 2.3 2.1, 2.10 6.3 5.5, 5.1 2.2 2.5 2.3 6.2 1.2 2.1 2.10, 6.3 2.37, 2.38 2.17 6.2, 6.3	**Students will** • demonstrate knowledge and understanding of small engine theory • develop an understanding and knowledge of small engine repair. • engage in meaningful, hands-on, minds-on, and conceptual based activities related to small engine technology. • develop knowledge and understanding of marine technology. • develop skill and competencies with marine electrical, fuel systems, powerhead overhaul, mid-section, lower unit, trim/tilt components of marine engines. • understand electrical systems theory. • demonstrate knowledge and understanding of four cycle engines and stern drive systems. • develop skills and competencies with fuel systems, chassis systems and carburetors. • demonstrate knowledge and understanding of two and four stroke cycle engines. • demonstrate knowledge and understanding of content related to motorcycle technology. • develop competencies in the safe and efficient use of the tools, machines, materials and processes of small engine technology. • develop competencies with use of tools and measurements, portable two cycle equipment and engine tune up. • develop personal and professional leadership skills through involvement with the SkillsUSA-VICA student organization activities. • demonstrate employability and personal management skills relative to careers through the Professional Development Program. • apply concepts from mathematics, science, and communications in the context of collision repair.

Connections

- Kentucky Occupational Skill Standards
- Kentucky Tech Curriculum
- Related Skill Standards Certification
- Professional Development Program
- Secretary's Commission on Achieving Necessary Skills (SCANS Skills)

Desktop Publishing

Course Description: This program includes touch keyboarding, computer fundamentals, introduction to graphic communications, design, layout, and paste-up, typography and typesetting, and desktop publishing for graphics. Also included are special applications for desktop publishing, lithographic camera and darkroom processes, digital acquisition, digital imaging, technical communications and workplace principles. Leadership and professionalism will be provided through SkillsUSA-VICA and the Professional Development Program.

Academic Expectations	Content/Process
	Students will
1.13, 2.22	• demonstrate use of knowledge and understanding in principles of design.
2.1, 2.3	• understand and apply basic concepts of printing processes.
1.1, 1.2	• develop competencies in graphic communication concepts and vocabulary
1.13, 5.2	• develop and demonstrate competencies in the production of layouts.
1.10	• understand and apply concepts of reading and writing job specifications for printing.
5.1	• understand and apply the use of a paste-up board.
6.1, 6.3	• apply concepts from mathematics, science, and communications in the context of desktop publishing.
2.1, 2.3	• engage in meaningful, hands-on, minds-on, and conceptual based desktop publishing activities.
2.17, 5.4	• develop workplace readiness social and employability skills necessary to work with others, and reach an employable exit point.
1.16	• develop competencies in electronic typesetting
5.5, 6.3	• demonstrate and develop competencies in the parameters of hardware and software.
2.36, 2.38	• develop personal and professional skills through involvement with the SkillsUSA-VICA student organization activities.

Connections

- Kentucky Occupational Skill Standards
- Kentucky Tech Curriculum
- Professional Development Program
- PIA (Printing Industries of America)
- Secretary's Commission on Achieving Necessary Skills (SCANS Skills)

Diesel Technology

Course Description: This program teaches the skills needed to analyze malfunctions and to repair, rebuild and maintain construction equipment, farm equipment, or medium and heavy trucks. This program includes climate control, computer fundamentals, mechanical concepts, introduction to diesel engines, and introduction to maintenance welding. Also included are hydraulics, power trains, brakes, electrical systems for diesel equipment, and diesel engine repair. Leadership and professionalism will be provided through SkillsUSA-VICA and the Professional Development Program.

Academic Expectations	Content/Process
	Students will
5.5	• understand and apply basic concepts of diesel engine repair.
2.3	• understand and apply basic concepts of climate control systems.
2.1, 2.10	• engage in meaningful, hands-on, minds-on, and conceptual based diesel technology based activities.
5.1, 6.3	• develop competencies in the safe and efficient use of the tools, machines, materials, and processes of diesel technology.
6.3	• apply concepts from mathematics, science, and communications in the context of automotive technology.
2.2, 5.1	• develop and demonstrate competencies with suspension and steering systems.
1.1	• demonstrate knowledge and understanding of basic fuel injection systems.
2.11	• develop competencies and understanding of power trains and undercarriage systems.
1.16	• use computer based technologies to process information, manipulate computer control systems and diagnostic capabilities.
5.4	• develop skills necessary to work with others to solve problems.
2.3	• develop skills and competencies with electrical systems for diesel equipment.
2.10, 2.3	• develop skills, knowledge, technical competencies and understanding of hydraulic systems.
2.36 ,2.38	• develop personal and professional skills through involvement with the SkillsUSA-VICA student organization activities.
2.17	• demonstrate employability and social skills relative to careers.

Connections

- Kentucky Occupational Skill Standards
- Kentucky Tech Curriculum
- NATEF (National Automotive Technicians Education Foundation, Inc.) ASE (Automotive Service Excellence) Certification in Diesel Technology
- Professional Development Program
- Secretary's Commission on Achieving Necessary Skills (SCANS Skills)

Electrical Residential/Commercial Technology

Course Description: This program includes DC circuits, AC circuits, electrical drafting, national electric code, and electrical construction. Also included is computer fundamentals and industrial safety. Leadership and professionalism will be provided through SkillsUSA-VICA and the Professional Development Program.

Academic Expectations	Content/Process
1.1, 1.10 2.2 2.1, 2.3 1.11 5.5 5.1 2.3, 5.5 5.4 5.2, 6.2 5.4 2.17 2.3, 2.5 6.3 2.2 2.13 2.37, 2.38 2.36	**Students will** • develop competencies and skills in the area of electrical drafting • develop competencies and skills with devices and circuits. • engage in meaningful, hands-on, minds-on and conceptual based activities in the area of electrical technology. • develop skills and competencies with electrical construction. • demonstrate knowledge and understanding of the National Electrical Code and Poly phase Power Calculations. • demonstrate knowledge and skill in working with transformers. • develop competencies in the safe and efficient use of the tools, machines, materials, and processes of electrical technology. • demonstrate knowledge and skill with home automation technology and manufactured housing applications. • develop competencies and skills in the area of digital techniques. • develop knowledge and skills with the applications of microprocessors and fiber optics. • develop skills necessary to work with others and solve problems. • understand and apply knowledge of direct current circuits and alternating current circuits as related to electrical technology. • demonstrate knowledge and understanding of fluid power systems. • demonstrate knowledge and understanding of programmable logic controllers and electrical motor controls. • demonstrate knowledge and understanding of rotating machinery. • develop personal and professional leadership skill through participation in the SkillsUSA-VICA student organization activities. • demonstrate employability and social skills relative to careers.

Connections

- Kentucky Occupational Skill Standards
- Kentucky Tech Curriculum
- EIA—Electronics Industries of America Certification or other Certification Area
- Professional Development Program
- Secretary's Commission on Achieving Necessary Skills (SCANS Skills)

Industrial Systems Maintenance

Course Description: This program includes training in basic electricity, blueprint/ schematic reading, basic computer systems, fluid power, rotating machinery and motor controls, basic machine tool and welding and industrial equipment preventative maintenance and troubleshooting. This course is usually delivered through existing programs and can be tailored to - several multi-skilled training needs. Other courses that can easily be included as part of this program are air conditioning, metal fabrication, carpentry, mechanics, etc. Leadership and professional development training will be provided through SkillsUSA-VICA and the Professional Development Program.

Academic Expectations	Content/Process
	Students will
1.1, 2.2	• understand and apply basic electricity concepts and knowledge as related to industrial maintenance.
1.10	• demonstrate knowledge and skill in blueprint reading and electrical drafting.
2.3	• demonstrate knowledge, understanding, and competencies with fluid power systems.
5.5	• develop skills and competencies in maintaining industrial equipment.
5.5, 1.1	• demonstrate knowledge and understanding of the maintenance of industrial equipment.
2.10	• engage in hands-on, minds-on, and conceptual based industrial maintenance activities.
2.5	• develop skill and understanding of principles and applications of power mechanics.
2.12, 5.2	• demonstrate knowledge and skills needed to perform maintenance, repair or replacement of programmable logic controllers and other electronic controllers.
2.8, 2.7	• demonstrate skill and competencies with electrical motor controls.
6.3, 1.1	• develop knowledge and skill with the applications and fundamentals of machine tools.
2.5	• demonstrate knowledge and competencies with oxy-fuel systems and shielded metal arc welding.
	• demonstrate knowledge and understanding of industrial safety.
2.31	• develop personal and professional leadership skills through participation with the SkillsUSA-VICA student organization activities.
2.37, 2.38	
2.36	• demonstrate employability social and personal management skills relative to careers through the Professional Development Program.
6.2, 6.3	• apply concepts from mathematics, science, and communications in the context of collision repair.

Connections

- Kentucky Occupational Skill Standards
- Kentucky Tech Curriculum
- Professional Development Program
- Secretary's Commission on Achieving Necessary Skills (SCANS Skills)

Industrial Automation Technology

Course Description: Instruction and practical experiences are gained with setting up automatic machines, direct and alternating circuits, robotics, fluid power systems, economics and financial management, processing equipment, and digital systems and microprocessors that work together as part of a total automated manufacturing system. Participation in the SkillsUSA-VICA student organization will also be an integral part of this course.

Academic Expectations	Content/Process
1.16, 5.1 2.3, 5.5 2.1, 2.10 2.12, 1.16 2.3, 5.1 1.1, 2.1, 2.7 6.3 2.3, 5.1, 2.3, 2.10 1.16 2.12, 2.13 2.37, 2.38 5.1, 2.3 2.36 2.17	**Students will** • demonstrate skill and knowledge of devices and circuits, electrical construction, digital electronics and microprocessors within the context of Industrial Automation. • demonstrate understanding of direct current and alternating current circuits within the context of manufacturing systems. • engage in hands-on, minds-on, and conceptual based activities related to industrial automation technology. • develop understanding and skill with programmable logic controllers. • demonstrate knowledge and understanding of fluid power systems and advanced pneumatic and hydraulic systems. • apply concepts from mathematics, science, and communications within the context of manufacturing systems. • develop knowledge and understanding of flexible manufacturing systems. • develop knowledge and understanding of computer-integrated manufacturing. • demonstrate knowledge and understanding of robotics and robotics applications within context of manufacturing systems. • use computer based technologies as related to concepts within manufacturing technology. • understand concepts of statistical process control and quality control and management. • develop personal and professional skills through involvement with the SkillsUSA-VICA student organization activities. • develop competencies in the safe and efficient use of the tools, machines, materials and processes of industrial automation technology. • demonstrate employability and social skills relative to careers.

Connections

- Kentucky Occupational Skill Standards
- Kentucky Tech Curriculum
- Kentucky Manufacturing Skill Standards
- Professional Development Program
- Secretary's Commission on Achieving Necessary Skills (SCANS Skills)

Industrial Chemical Technology

Course Description: This program includes DC circuits, industrial safety, electrical math, blueprint reading, and maintaining industrial equipment. Also included is introduction to chemical technology, technical applied chemistry, AC circuits, technical math, and fluid power. Leadership and professionalism will be provided through SkillsUSA-VICA and the Professional Development Program.

Academic Expectations	Content/Process
6.1, 1.1 1.10 2.2, 2.3 5.5, 1.2 6.2, 2.10 2.31 2.37, 2.38 2.36 6.2, 6.3	**Students will** • understand and apply basic electricity concepts and knowledge as related to industrial chemical technology. • demonstrate knowledge and skill in blueprint reading. • demonstrate knowledge, understanding, and competencies with fluid power systems. • demonstrate knowledge and understanding of the maintenance of industrial equipment. • engage in hands-on, minds-on, and conceptual based industrial chemical technology activities. • demonstrate knowledge and understanding with concepts of industrial safety. • develop personal and professional leadership skills through participation with the SkillsUSA-VICA student organization activities. • demonstrate employability and social skills relative to careers. • apply concepts from mathematics, science, and communications in the context of collision repair.

Connections

- Kentucky Occupational Skill Standards
- Kentucky Tech Curriculum
- Professional Development Program
- Secretary's Commission on Achieving Necessary Skills (SCANS Skills)

Industrial Electronics Technology

Course Description: This program includes basic AC & DC circuits, transformers, electronic devices & circuits, rotating machinery and motor controls, digital electronics, microprocessors, fiber optics, programmable logic controllers, fluid & pneumatic systems, and robotics systems. A solid base of communications and information management, technical mathematics and algebra, as well industrial safety and tool systems will be developed through direct application. Leadership and professionalism will be developed through SkillsUSA-VICA and the Professional Development Program.

Academic Expectations	Content/Process
1.1, 1.10 1.5 - 1.9 2.1 6.1 2.10 2.12 5.3 2.3, 5.5 5.1 1.1, 6.3 2.17 6.1, 5.1 2.13 5.5 2.5, 5.5 6.3 2.37, 2.38 2.36 6.2, 6.3	**Students will** • develop competencies and skills in the area of electronic drafting • develop competencies and skills with digital techniques. • engage in meaningful, hands-on, minds-on and conceptual based activities in the area of electronic technology. • develop skills and competencies with electrical/electronics math/algebra. • demonstrate knowledge and understanding of service equipment and digital techniques. • demonstrate knowledge and skill in working with transformers. • develop competencies in the safe and efficient use of the tools, machines, materials, and processes of industrial electronic technology. • develop competencies and skills in the area of power distribution systems. • develop knowledge and skills with the applications of microprocessors and fiber optics. • develop skills necessary to work with others and solve problems. • understand and apply knowledge of direct current circuits and alternating current circuits as related to industrial electronic technology. • demonstrate knowledge and understanding of fluid power/pneumatic systems. • demonstrate knowledge and understanding of programmable logic controllers and electrical motor controls. • develop skills and competencies with solid state motor controls and robotics systems. • demonstrate knowledge and understanding of rotating machinery and electric motor controls. • develop personal and professional leadership skill through participation in the SkillsUSA-VICA student organization activities. • demonstrate employability and personal management skills relative to careers through the Professional Development Program. • apply concepts from mathematics, science, and communications in the context of collision repair.

Connections

- Kentucky Occupational Skill Standards
- Kentucky Tech Curriculum
- Skill Standards such as EIA (Electronics Institute of America) or other.
- Professional Development Program
- Secretary's Commission on Achieving Necessary Skills (SCANS Skills)

Machine Tool Technology

Course Description: This program includes applied mathematics, basic blueprint reading, computer fundamentals, fundamentals of machine tools, manual programming CAD/CAM, CNC and applied machining. Leadership and professionalism will be provided through SkillsUSA-VICA and the Professional Development Program.

Academic Expectations	Content/Process
1.10, 1.13 2.3, 2.10 1.1, 5.5 6.1, 2.8 2.1, 2.3 2.7 2.12, 2.10 1.16 1.16, 5.2 2.7, 6.3 2.13 2.17, 5.4 2.37, 2.38 6.2 2.2 2.12 2.36	**Students will** • demonstrate knowledge and skill in blueprint reading • develop competencies in the safe and efficient use of the tools, machines, materials and processes of machine tool technology. • demonstrate and develop skills and knowledge with the fundamentals of machine tools. • understand and apply the concepts of manual programming, CAD/CAM and CNC. • engage in meaningful, hands-on, minds-on and conceptual based machine tool activities. • develop and demonstrate skills and abilities with concepts of applied machining. • understand, develop and apply skills with CNC Programming. • understand, develop and apply skills in industrial machining. • develop knowledge and understanding of 3-D programming techniques. • develop skills and abilities with precision measurement for machinist and the use of the machinist handbook. • develop skills and knowledge with statistical process control. • develop skills necessary to work with others and solve problems. • engage in personal and leadership activities associated with the SkillsUSA-VICA student organization. • concepts from mathematics, science and communications in the context of machine tool technology. • develop, understand, apply skills in metallurgy. • demonstrate knowledge and competencies with oxy-fuel systems and shielded metal arc welding. • demonstrate employability and social skills relative to careers.

Connections

- Kentucky Occupational Skill Standards
- Kentucky Tech Curriculum
- NTMA (National Tool and Machinists Association) Standards
- Kentucky Manufacturing Skill Standards
- Professional Development Program
- Secretary's Commission on Achieving Necessary Skills (SCANS Skills)

Major Appliance Technology

Course Description: This program includes installing, servicing and repairing automatic washers, automatic dishwashers, gas/electric dryers, gas/electric ranges, window air conditioners, trash compactors and microwave ovens. Academic courses include theory, and laboratory experiences in the following areas: electricity, electrical components, blueprint reading, industrial safety, air conditioning, refrigeration, gas/electric appliances, microwave ovens, mathematics, science and communications. Leadership and professionalism will also be an integral part of this course, provided through participation in SkillsUSA-VICA and the Professional Development Program.

Academic Expectations	Content/Process
	Students will
2.1, 5.1	• understand and apply basic refrigeration and air conditioning concepts and knowledge as related to major appliance technology.
1.1, 2.7, 2.13 5.1, 2.31	• demonstrate skill and knowledge of refrigeration and air conditioning applications. • demonstrate skill and knowledge of electrical components and test equipment.
2.2	• develop competencies in the safe and efficient use of the tools, machines, materials and processes of major appliance technology.
2.3	• understand and demonstrate skill with concepts of air conditioning and refrigeration principles.
1.13, 1.10 2.31	• develop skill and knowledge of gas/electric appliance applications. • demonstrate skill and understanding of blueprint reading as related to the major appliance profession.
6.1, 2.10	• develop skill and knowledge with electrical principles and industrial safety.
6.3	• engage in meaningful, hands-on, minds-on, and conceptual based activities related to major appliance technology.
5.5	• demonstrate knowledge and skill of serving microwave ovens.
2.37, 2.38	• develop skills and competencies in the service of trash compactors.
2.17, 5.4	• develop personal and professional skills through involvement with the SkillsUSA-VICA student organization activities.
6.2, 6.3 2.36	• demonstrate skill necessary to work with others to solve problems. • apply concepts from mathematics, science, and communications in the context of air conditioning technology.
2.15	• demonstrate employability and social skills relative to careers. • develop an understanding of EPA laws and regulation as related to major appliance technology.

Connections

- Kentucky Occupational Skill Standards
- Kentucky Tech Curriculum
- National Skill Standards Certification
- Professional Development Program
- Secretary's Commission on Achieving Necessary Skills (SCANS Skills)

Masonry

Course Description: This program is designed to teach masonry students to perform at national and state industry standards. This program includes introduction to construction, safety, blueprint reading, introduction to masonry, advanced masonry, brick and special techniques in brick construction. Upon successful completion of identified courses meeting industry standards students will be issued a "competent worker certificate". Participation in the SkillsUSA-VICA student organization will also be an integral part of this course.

Academic Expectations	Content/Process
2.38 6.3, 2.1 1.10, 1.13 2.3, 6.1, 2.10 5.5, 1.1 2.17 2.38, 2.37 1.3, 2.8 5.1, 1.10 1.11 2.36 6.2, 6.3	**Students will** • develop competent entry level basic skills to meet national construction industry standards. • master math, science, writing, reading and communication skills to obtain an entry level position in the construction industry. • develop industry standards and core competencies in blueprint reading, safety, introduction to masonry, advanced masonry, brick, and special techniques in brick construction. • engage in meaningful, hands-on, minds-on and conceptual based activities in the area of masonry. • develop competencies in the area of tools, machines, materials and processes of masonry. • develop skills necessary to work with others and solve problems. • develop personal and professional leadership skills through the SkillsUSA-VICA professional development program. • identify careers associated with the construction industry. • develop core skills to be a competent and productive worker in the construction industry and meet industry standards. • develop career portfolios to keep records of training, transcripts and skills obtained during training. • demonstrate employability and social skills relative to careers. • apply concepts from mathematics, science, and communications in the context of masonry.

Connections

- Kentucky Occupational Skill Standards
- Associated General Contractors (AGC) Craftworkers Training Program
- KY- Homebuilders
- NCCER Craft Training Program
- Professional Development Program
- Kentucky Tech Curriculum
- Secretary's Commission on Achieving Necessary Skills (SCANS Skills)

Metal Fabrication

Course Description: This course includes training in heat load calculations, duct design, blueprint reading, welding, industrial safety, metal trade information and metals, parallel line layout, triangulation, radial line development and residential and industrial maintenance. Sheet metal and advanced sheet metal fabrication techniques will be developed through the use and understanding of the many hand and power tools used in the craft. Leadership and professional development training will be provided through SkillsUSA-VICA and the Professional Development Program.

Academic Expectations	Content/Process
1.1, 2.2 1.10, 5.5 2.3 6.2 6.3 2.1,2.10 2.31, 2.5 5.3 2.9 2.10 2.7, 2.11 5.5 2.3 2.37, 2.38 2.36 6.2, 6.3	**Students will** • understand and apply heat load calculations to duct design layouts. • demonstrate knowledge and skill in blueprint reading. • demonstrate knowledge and understanding, of various duct designs. • develop skills and competencies in maintaining industrial equipment. • demonstrate basic welding skills related to metal fabrication. • engage in hands-on, minds-on, and conceptual based metal fabrication activities. • understand and demonstrate a working knowledge of industrial safety. • develop and demonstrate a knowledge of metal trades and metals. • develop and apply parallel line layouts. • develop and apply triangulation layout techniques. • demonstrate the ability to apply radial line development. • demonstrate a knowledge of all hand tools and techniques. • develop and demonstrate the ability to form various assemblies including, but not limited to, air handling duct work. • develop personal and professional leadership skill through participation with the SkillsUSA-VICA student organization activities. • demonstrate employability, social and personal management skills relative to careers through the Professional Development Program. • apply concepts from mathematics, science, and communications in the context of collision repair.

Connections

- Kentucky Occupational Skill Standards
- Kentucky Tech Curriculum
- Professional Development Program
- Secretary's Commission on Achieving Necessary Skills (SCANS Skills)

Multimedia Technology

Course Description: This program includes business English, professional development, keyboarding, microcomputer operating systems, audio and video systems, Internet and intranet applications and computer networking concepts. Also included are telecommunications, computer fundamentals, economics and financial management, design, layout, and paste-up, typography and typesetting, digital acquisition, digital imaging, marketing, multimedia, webpage design and workplace principles. Leadership and professionalism will be provided through SkillsUSA-VICA and the Professional Development Program.

Academic Expectations	Content/Process
1.16, 2.3 2.1 1.13, 2.22 2.1, 6.1 1.16, 2.1 1.13, 5.2 1.13, 2.22 2.1, 2.7 ,1.1 2.17, 5.4 1.3 5.2, 6.2 5.5, 6.3 2.37, 2.38 2.36	**Students will** • understand and apply basic concepts of operating systems in micro-computing • demonstrate knowledge and understanding with computer networking concepts. • demonstrate knowledge and understanding in principles of design. • engage in meaningful, hands-on, minds-on, and conceptual based multimedia technology activities. • develop competencies in telecommunications concepts • develop and demonstrate competencies in the production of layouts. • understand and apply concepts of webpage design. • apply concepts from mathematics, science, and communication in the context of multimedia technology. • develop workplace readiness and employability skills necessary to work with others, and reach an employable exit point. • develop competencies in electronic typesetting. • understand and apply concepts of Internet and intranet applications • demonstrate and develop competencies in the parameters of hardware and software. • develop personal and professional skills through involvement with the SkillsUSA-VICA student organization activities. • demonstrate employability and social skills as relative to careers.

Connections

- Kentucky Occupational Skill Standards
- Kentucky Tech Curriculum
- Professional Development Program
- Secretary's Commission on Achieving Necessary Skills (SCANS Skills)

Plastics Technology

Course Description: This program will provide students with a variety of skills and abilities related to the plastics industry. Content will include application of computers, fluid and mechanical power systems and manufacturing processes related to the plastics industry. Content will also cover injection molding, physics concepts, motors and motor control, polymer science and testing and mold setting. Participation in the SkillsUSA-VICA student organization and professional development program will also be an integral part of this program.

Academic Expectations	Content/Process
1.16 2.2,5.5 6.1, 6.3 1.1, 1.3 2.3, 5.5 6.2 2.1, 6.1, 2.10 2.5 2.3 6.1, 2.3 5.5 2.37, 2.38 2.17, 5.4 5.1, 2.10 2.13	**Students will** • understand and develop skill with computer applications. • understand and develop skill with fluid and mechanical power systems. • apply concepts from mathematics, science and communications in the context of plastics technology. • demonstrate and develop skills in the areas of manufacturing processes as related to the plastics industry. • understand and apply the concepts of basic electronics as applied within the context of the plastics industry. • develop knowledge and understanding of plastic processes and materials. • engage in meaningful, hands-on, minds-on and conceptual based plastics technology activities. • apply concepts of UTC Physics with the context of plastics technology. • develop knowledge and understanding related to polymer science and testing. • demonstrate knowledge and understanding of motors and motor control as related to mold setting. • develop knowledge skills, and abilities with concepts of injection molding. • engage in personal and leadership activities associated with the SkillsUSA-VICA student organization. • demonstrate employability and social skills relative to careers. • develop competencies in the safe and efficient use of the tools, machines, materials and processes of plastics technology. • develop and integrate knowledge and skills in quality control concepts.

Connections

- Kentucky Occupational Skill Standards
- Kentucky Tech Curriculum
- Professional Development Program
- Secretary's Commission on Achieving Necessary Skills (SCANS Skills)

Plumbing Technology

Course Description: This program includes basic blueprint reading, blueprint reading for construction, basic welding for non-majors, fundamentals of electricity for non-majors, and plumbing fundamentals. Also included are fixtures and appliances, service and repair, computer fundamentals, industrial safety, and fundamentals of mathematics. Leadership and professionalism will be provided through SkillsUSA-VICA and the Professional Development Program.

Academic Expectations	Content/Process
2.36 1.10, 5.5 5.5, 2.3 6.1, 6.3 5.1 1.11 2.3, 6.1 2.36 2.37, 2.38 2.1, 2.3, 2.10 2.36 2.37, 2.17	**Students will** • identify career paths in the construction industry. • demonstrate knowledge and basic skills for blueprint reading. • demonstrate knowledge and basic skills for service and repair of plumbing systems and appliances. • apply concepts from mathematics, science, communications and computer skills in the context of plumbing technology. • develop career portfolios to keep a personal record of training, transcripts, and skills obtained during training. • develop competencies in the safe use of tools and equipment. • develop skills to be a competent and productive worker in the construction industry. • develop personal and professional leadership skills through SkillsUSA-VICA student organization activities. • understand and demonstrate all core course content related to residential and commercial plumbing. • engage in hands-on, minds-on and conceptual based activities related to plumbing systems and applications. • demonstrate employability and social skills relative to careers. • demonstrate knowledge and understanding of work ethics and expectations • desired for the construction industry.

Connections

- Kentucky Occupational Skill Standards
- Kentucky Tech Curriculum
- Professional Development Program
- NCCER Craft Training Program
- Secretary's Commission on Achieving Necessary Skills (SCANS Skills)

Printing Technology

Course Description: This program includes touch keyboarding, computer fundamentals, economics and financial management, introduction to graphic communications, design, layout, and paste-up, and finishing and binding. Also included are lithography and platemaking, press operations, special applications, technical communications and workplace principles. Leadership and professionalism will be provided through SkillsUSA-VICA and the Professional Development Program.

Academic Expectations	Content/Process
1.13, 2.22 5.2 1.1, 2.1 6.3 2.3 2.10 2.17 1.2, 1.3 1.2, 1.3 2.1 5.1 5.2 2.37, 2.38 2.36	**Students will** • demonstrate understanding and knowledge of principles of design. • demonstrate and develop competencies in the production of layouts. • understand and apply basic concepts of printing processes. • apply concepts from mathematics, science, and communications in the context of printing technologies. • engage in meaningful, hands-on, minds-on, and conceptual based printing activities. • develop workplace readiness and employability skills necessary to work with others, and reach an employable exit point. • develop competencies in graphic communication concepts and vocabulary. • understand and apply concepts of reading and writing job specifications for printing. • develop competencies in finishing operations needed to complete a printing job. • develop and demonstrate competencies in bindery equipment operations. • understand and apply the use of a paste-up board. • develop competencies in darkroom operations. • develop personal and professional skills through involvement with the SkillsUSA-VICA student organization activities • demonstrate employability and social skills relative to careers.

Connections

- Kentucky Occupational Skill Standards
- Kentucky Tech Curriculum
- Professional Development Program
- PIA (Printing Industries of America)
- Secretary's Commission on Achieving Necessary Skills (SCANS Skills)

Residential/Commercial Electricity

Course Description: This program includes DC circuits, AC circuits, electrical drafting, national electric code, and electrical construction. Also included is computer fundamentals and industrial safety. Leadership and professionalism will be provided through SkillsUSA-VICA and the Professional Development Program.

Academic Expectations	Content/Process
1.10, 1.13 2.2, 5.5 2.3, 2.10 6.1, 1.1 1.11, 2.11 2.3, 5.5 1.10 5.3 1.16 6.2 2.17, 5.4 2.2, 5.2 2.5, 2.10 1.16 5.1 2.37,2.38 2.36	**Students will** • develop competencies and skills in the area of electrical drafting • develop competencies and skills with devices and circuits. • engage in meaningful, hands-on, minds-on and conceptual based activities in the area of electrical technology. • develop skills and competencies with electrical construction. • demonstrate knowledge and understanding of the National Electrical Code and Poly phase Power Calculations. • demonstrate knowledge and skill in working with transformers. • develop competencies in the safe and efficient use of the tools, machines, materials, and processes of electrical technology. • demonstrate knowledge and skill with home automation technology and manufactured housing applications. • develop competencies and skills in the area of digital techniques. • develop knowledge and skills with the applications of microprocessors and fiber optics. • develop skills necessary to work with others and solve problems. • understand and apply knowledge of direct current circuits and alternating current circuits as related to electrical technology. • demonstrate knowledge and understanding of fluid power systems. • demonstrate knowledge and understanding of programmable logic controllers and electrical motor controls. • demonstrate knowledge and understanding of rotating machinery. • develop personal and professional leadership skill through participation in the SkillsUSA-VICA student organization activities. • demonstrate employability and social skills relative to careers.

Connections

- Kentucky Occupational Skill Standards
- Kentucky Tech Curriculum
- EIA—Electronics Industries of America Certification or other Certification Area
- Professional Development Program
- Secretary's Commission on Achieving Necessary Skills (SCANS Skills)

Residential/Commercial Carpentry

Course Description: This program will teach students to perform to national construction industry standards. The program will include core building courses in residential and commercial blueprint reading, introduction to construction, construction safety, floor and wall framing, metal stud construction and heavy commercial construction. Upon completion of identified courses and meeting industry expectations, students will be issued a "competent worker certificate. Leadership and professionalism will be provided through SkillsUSA-VICA and the Professional Development Program.

Academic Expectations	Content/Process
	Students will
1.1, 2.37	• develop core competencies in the areas of safety, residential/commercial blueprint reading, introduction to construction, floor and wall framing, metal studs, and heavy commercial construction.
1.2 2.38	• develop competencies and skills in the area of site layout and foundations. • develop skills to be a competent and productive worker in the construction industry.
6.3	• apply concepts from mathematics, science, and communications in the context of residential/commercial carpentry.
2.1, 2.7	• develop skills and competencies in the area of ceiling and roof framing.
1.10	• demonstrate understanding and knowledge related to both residential and commercial materials, processes, techniques and applications.
2.17	• develop skills necessary to work as part of a team to solve problems, and to develop and construct residential and commercial structures.
6.2	• develop core competencies in construction safety and the efficient use of tools machines, materials, processes and applications.
2.36	• develop career portfolios to keep a record of training, transcripts, and skills obtained during training.
2.18	• develop skills and competencies related to workplace readiness and consumer economics.
2.36	• develop personal and professional skills through involvement with the SkillsUSA-VICA student organization activities.
2.19	• demonstrate skill necessary to work with others to solve problems.
2.36	• demonstrate employability and social skills relative to careers.

Connections

- Kentucky Occupational Skill Standards
- Associated General Contractors -AGC Craftsworker Training Program
- NCCER Craft Training Program
- Professional Development Program
- Kentucky Homebuilders Craft Training Program
- Kentucky Tech Curriculum
- Secretary's Commission on Achieving Necessary Skills (SCANS Skills)

Telemedia Technology

Course Description: This program includes instruction in the operation of various audio/video equipment which includes studio equipment, control room equipment, editing equipment, and electronic field production equipment. Academic instruction includes course expectations, safety, occupational opportunities, job duties and responsibilities, and vocabulary. Leadership and professional development training shall be an integral part of this program and provided through SkillsUSA-VICA and the Professional Development Program.

Academic Expectations	Content/Process
1.10, 2.10 1.5 - 1.9 2.1 2.12 1.1, 5.3 1.16 5.1, 2.17 1.1, 6.3 1.12 2.17, 5.4 2.37, 2.38 2.36	**Students will** • develop an understanding and knowledge of television production concepts as related to the industry. • develop skills and demonstrate competencies in the operation of studio equipment . • demonstrate knowledge and understanding of audio/video control room equipment. • understand and apply skills necessary for efficient use and operation of editing equipment. • demonstrate skill and knowledge of the operation of electronic field production equipment. • develop knowledge and understanding of computer technology. • understand and demonstrate personal and professional skills through producing and directing of television programs. • develop an understanding of closed media transmission systems. • develop an understanding of broadcast transmission systems. • demonstrate team building competencies through analysis of television production values. • develop personal and professional leadership skill through participation with the Vocational Industrial Clubs of America SkillsUSA-VICA student organization activities. • demonstrate employability and social personal management skills related to careers through the Professional Development Program.

Connections

- Kentucky Occupational Skill Standards
- Kentucky Tech Curriculum
- FCC rules, regulations and licensing standards
- Professional Development Program
- Secretary's Commission on Achieving Necessary Skills (SCANS Skills)

Visual Communication Art Technology

Course Description: This program includes keyboarding, computer fundamentals, fundamentals of drawing, traditional layout and graphic design, and color theory applications. Also included are production art, traditional illustration, typography concepts, screen printing, creative typography applications, and computer graphic design. Leadership and professionalism will be provided through SkillsUSA-VICA and the Professional Development Program.

Academic Expectations	Content/Process
2.3, 2.2 1.16, 2.7 2.22, 2.23 2.22, 2.23 2.25, 1.2 1.2, 2.22 2.22, 2.23, 2.37, 5.1 2.22, 2.23, 1.13 2.7, 5.1 1.10 2.37, 2.38 2.36 6.1, 6.3	**Students will** • demonstrate knowledge and understanding of keyboarding operations and care of the equipment. • understand the use of a computer for word processing, spreadsheets, and • databases. • develop the ability to "see" as an artist. • understand the three characteristics of color. • demonstrate knowledge of printing. • develop understanding and competencies in the use of the computer as an electronic drawing tool. • engage in meaningful, hands-on, minds-on, and conceptual based visual • communication art activities. • develop workplace readiness and employability skills necessary to work with others, and reach an employable exit point. • develop competencies and skills in drawing and painting skills from developing ideas and concepts. • understand the elements and principles of design and development of studio skills. • demonstrate knowledge and understanding of the rules and uses of typography. • understand and apply concepts of advertising. • develop personal and professional leadership skills through SkillsUSA-VICA student organization activities. • demonstrate employability and social skills relative to careers. • apply concepts from mathematics, science, communications and computer skills in the context of visual communication arts.

Connections

- Kentucky Occupational Skill Standards
- Kentucky Tech Curriculum
- Professional Development Program
- Secretary's Commission on Achieving Necessary Skills (SCANS Skills)

Welding

Course Description: This program includes blueprint reading for welding, industrial safety, gas tungsten arc welding, gas metal arc welding, and certification welding. Also included are oxy-fuel systems, oxy-fuel cutting, shielded metal arc welding, and shielded metal arc welding plate. Leadership and professionalism will be provided through SkillsUSA-VICA and the Professional Development Program.

Academic Expectations	Content/Process
2.2, 6.1 1.10, 1.13 5.1, 2.3 5.5 2.5 2.17 1.1, 2.1 2.1, 6.3 5.5, 6.2 2.1, 2.37, 2.38 2.5, 2.1 2.1 1.2, 2.37 2.36	**Students will** • understand and apply basic electricity concepts and knowledge as related to welding technology. • demonstrate knowledge and skill in blueprint reading. • develop competencies in the safe and efficient use of the tools, machines, materials and processes of welding technology. • develop and demonstrate skills and knowledge with Gas Tungsten Arc Welding. • develop and demonstrate skills and knowledge with Gas Metal Arc Welding. • develop skills necessary to work with others and solve problems. • apply concepts from mathematics, science, and communications in the context of welding technology. • develop and demonstrate competencies in Plasma Arc Systems. • demonstrate knowledge and competencies with Oxy-Fuel Systems. • develop skill and understanding of Shielded Metal Arc Welding concepts and applications. • develop personal and professional skills through involvement with the SkillsUSA-VICA student organization activities. • demonstrate knowledge and competencies in metallurgy of common metals used in welding trades. • demonstrate knowledge and competencies of basic employability skills E9.1-E9.18 (Plan and organize work)(Demonstrate Ability)(AWS Standards) • demonstrate career awareness and employment possibilities in the welding field including lifelong career paths such as boilermakers, military, CWE, CWI, college and certification programs. • develop skill and understanding of automated welding systems.

Connections

- Kentucky Occupational Skill Standards
- American Welding Society Certification (AWS Certification)
- Professional Development Program
- Kentucky Tech Curriculum
- Secretary's Commission on Achieving Necessary Skills (SCANS Skills)

Wood Products Manufacturing

Course Description: This program will provide students with a variety of skills and abilities as related to the commercial wood products manufacturing industry. Content will include application of computers skills, cabinet making processes, materials and products, wood finishes and finishing techniques. The content will also provide experiences with furniture and mill work production and technical drawing and blue print reading. Leadership and professional development skills will be taught through participation in the SkillsUSA-VICA student organization and professional development program which will be an integral part of this program.

Academic Expectations	Content/Process
6.3 5.5, 1.1 2.3 1.1, 2.1,2.7 1.2 6.2 2.37 2.36, 2.38 5.1, 2.10, 6.2, 1.3 1.16 2.36, 2,17	**Students will** • develop knowledge and skills applicable to the wood products manufacturing industry. • develop and apply skills in cabinet making technology and demonstrate the ability to apply cabinet making knowledge to a variety of materials, processes and products. • develop knowledge and understanding of wood finishes and applications. • apply concepts from mathematics, science, and communications within the context of wood products manufacturing. • develop skill and knowledge in technical drawing and blueprint reading. • develop knowledge and skills in the construction of furniture products. • complete a cooperative work experience within the wood products manufacturing industry. • develop personal and professional skills through involvement with the SkillsUSA-VICA student organization. • develop competencies in the safe and efficient use of tools, machines, materials and processes of wood products manufacturing. • acquire skill and knowledge of mill work technologies within the context of wood products manufacturing. • use computer fundamentals and computer aided drafting as related to wood product manufacturing. • demonstrate employability and social skills relative to careers.

Connections

- Kentucky Occupational Skill Standards
- Kentucky Tech Curriculum
- Professional Development Program
- Secretary's Commission on Achieving Necessary Skills (SCANS Skills)